

Serial No.: 09/274,797  
Response filed April 23, 2004

Attorney's Docket No.: 10559-237001/P8886

Amendment to the Claims:

This listing of claims replaces all prior versions, and listings, of claims in the application:

1 - 18 (cancelled):

19 - 36 (not entered):

37. (currently amended): A method comprising:  
receiving a forward resource management control cell in a network switch;

forwarding the forward resource management control cell to a destination node;

determining, after said forwarding, rate-based, flow-control data in a-the network switch, in response to receipt of a-forward resource management control cell in the network switch, the forward resource management control cell corresponding to a connection linking a source node and a-the destination node via the network switch;

storing the rate-based, flow-control data in the network switch before receipt of a backward resource management control cell in the network switch;

receiving in the network switch, from the destination node, a-the backward resource management control cell corresponding to the forward resource management control cell; and

modifying in the network switch the backward resource management control cell, before forwarding the backward resource management control cell to the source node, based on the rate-based, flow-control data determined in response to the receipt of the forward resource management control cell.

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38. (previously presented): The method of claim 37, wherein the forward resource management control cell comprises an asynchronous transfer mode forward resource management control cell and the backward resource management control cell comprises an asynchronous transfer mode backward resource management control cell.

39. (currently amended): The method of claim 37, further comprising:

~~storing the rate based, flow control data in a database in the network switch before receipt of the backward resource management control cell in the network switch; and~~

retrieving the rate-based, flow-control data from the a database using virtual channel data associated with the backward resource management control cell.

40. (currently amended): The method of claim 37, ~~wherein determining the rate based, flow control data in response to the receipt of the forward resource management control cell comprises further comprising:~~

~~receiving the forward resource management control cell in the network switch;~~

placing a management event record corresponding to the forward resource management control cell in a queue;

~~forwarding the forward resource management control cell;~~

removing the management event record from the queue; and

processing the management event record using a rate control algorithm to produce the rate-based, flow-control data.

41. (previously presented): The method of claim 40, wherein the management event record comprises virtual channel

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identification data corresponding to the forward resource management control cell, and said forwarding the forward resource management control cell occurs before said removing the management event record from the queue.

42. (previously presented): The method of claim 40, wherein processing the management event record comprises processing the management event record using explicit rate indication for congestion avoidance in ATM networks (ERICA) algorithm.

43. (previously presented): The method of claim 37, wherein the rate-based, flow-control data comprises explicit rate parameter data, and modifying the backward resource management control cell comprises inserting the explicit rate parameter data in the backward resource management control cell.

44. (previously presented): The method of claim 37, wherein the rate-based, flow-control data comprises a congestion indicator, and modifying the backward resource management control cell comprises setting a congestion indicator bit in the backward resource management control cell in accordance with the congestion indicator.

45. (currently amended): A data transmission apparatus comprising:

source port circuitry operative to send and receive control cells on a source virtual channel;

destination port circuitry operative to send and receive control cells over a destination virtual channel;

switching circuitry operatively coupling the source port circuitry and the destination port circuitry, the switching

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circuitry comprising circuitry to exchange data cells and control cells between the source virtual channel and the destination virtual channel;

management event circuitry operatively coupled to the source port circuitry to receive control cells from the source virtual channel and to compute rate-based, flow-control data in response to receipt of a forward resource management control cell that corresponds to a connection linking a source node and a destination node via the data transmission apparatus, wherein the computation of the rate-based, flow-control data occurs after forwarding of the forward resource management control cell and the computed rate-based, flow-control data is stored before receipt of a backward resource management control cell corresponding to the forward resource management control cell; and

return cell circuitry operatively coupled to the source and destination port circuitry and to the management event circuitry, the return cell circuitry comprising circuitry to receive control cells from the destination port circuitry, to modify a backward resource management control cell based on the rate-based, flow-control data computed by the management event circuitry, and to provide the modified backward resource management control cell to the source port circuitry for transmission over source virtual channels.

46. (previously presented): The apparatus of claim 45, wherein the management event circuitry comprises a processor connected to a memory, the memory comprising stored instructions to configure the processor to compute and store resource management data.

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47. (previously presented): The apparatus of claim 46, wherein the instructions to configure the processor comprise instructions to associate rate-based, flow-control data with source virtual channels.

48. (previously presented): The apparatus of claim 45, wherein the management event circuitry and the return cell circuitry comprise a shared processor coupled to memory circuitry.

49. (previously presented): The apparatus of claim 45, wherein the source port circuitry and the destination port circuitry comprise shared transmission circuitry coupled to a physical link.

50. (previously presented): The apparatus of claim 45, wherein data cells and control cells are fixed-sized asynchronous transfer mode cells.

51. (currently amended): A network switch comprising:  
means for sending and receiving control cells and data cells over a connection linking a source node and a destination node via the network switch;

means for initiating preparation of rate-based, flow-control data in response to receipt of a forward resource management cell from the source node and before receipt of a backward resource management cell corresponding to the forward resource management control cell, wherein preparation of the rate-based, flow-control data occurs after forwarding of the forward resource management cell and the prepared rate-based,

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flow-control data is stored before receipt of the backward resource management cell; and

means for modifying the backward resource management cell upon receipt using the prepared resource management data.

52. (previously presented): The network switch of claim 51, wherein the means for initiating preparation of resource management data comprises:

means for generating forward resource management (FRM) events from FRM cells in response to receipt of the FRM cells; and

means for storing the FRM events for later processing.

53. (previously presented): The network switch of claim 52, wherein the means for generating the FRM events comprises means for extracting virtual channel data from the FRM cells, and the means for storing the FRM events comprises a queue.

54. (previously presented): The network switch of claim 52, wherein the means for modifying the backward resource management cell comprises:

means for storing resource management data prepared using the FRM events; and

means for comparing received backward resource management (BRM) cells with the stored resource management data to determine whether to modify the BRM cells before forwarding.